the labors of the sanitary supervisor and reduces his salary about 20 per cent. The third amendment (Int. 1601) makes permissive, instead of mandatory, the establishment of divisions in the State Department of Health and gives the commissioner the power to increase or decrease the number of these divisions, to consolidate them, or to change the name of any division at his pleasure. This is an altogether unnecessary interference with the existing law, and if it had any effect it would be in the line of decreased efficiency as making the divisions impermanent and liable to change at the whim of any one in power for the time being. The fourth amendment (Int. 1602) strips the Public Health Council of its power to define the qualifications of directors of divisions, sanitary supervisors, local health officers, and public health nurses hereafter appointed. The introducer's object in this amendment is not apparent, but the result of its enactment would inevitably be to open these appointments to unqualified persons and to create a number of jobs to be given in reward for political services. The fifth and worst of this series of bad bills (Int. 1603) would deprive the Public Health Council of the power to establish sanitary regulations, would delegate this to the legislature, and would even abolish the present sanitary code unless it shall be approved by the present legislature—and how much chance it would have of being approved by a legislature which had already adopted these amendments one can well imagine.

These, briefly stated, are the bills by the enactment of which it is proposed to impair the efficiency of the health department and to vitiate the work it has already accomplished. What may be the reason for the introduction of these bills it is difficult to understand. Their passage would not be in the interests of economy, for the worst of them, if passed, would not save the state a dollar, and others would rather increase the expenses of health administration by reducing the efficiency of the department, by putting the formulation of a new code in the hands of inexperts and of men ignorant of sanitary science, and by opening many of the most responsible positions to incompetents. No business can save money in that way. The entire appropriation asked for by the health department is only about $400,000—a paltry sum in comparison with the saving of lives and of dollars as well, which it is certain will result if the present law is let alone.

As a direct result of the work of the department during the past year there are two thousand persons, one thousand of them children, alive to-day in this state, outside of New York City, who would have been in their graves but for the efforts of Dr. Biggs and the Health Council. Are Mr. Hinman and his colleagues in the legislature willing to let these and three or four thousand others (for the life saving in public health work is cumulative) die next year in order to save thirty-five thousand dollars in the salaries of the sanitary supervisors who are to be dropped?

We can not believe the legislature will pass these reactionary amendments or, if it does, that the governor will sign them. But it will be better to spare both the legislature and the governor trouble by killing the bills in committee. This would doubtless be their fate if every physician would at once file his protest with the chairmen of the committees which now have the bills under consideration. In such protest the bills should be referred to by their introductory numbers and the protest should be addressed to the chairman of the respective committee as follows: Introduction Number 1561 (the first one above mentioned), Judiciary Committee, Assemblyman Frank B. Thorn, chairman; Int. 1600, Ways and Means Committee, Assemblyman Alexander Macdonald, chairman; Int. 1601, 1602 and 1603, Public Health Committee, Assemblyman Gilbert T. Seelye, chairman. We need not add that prompt action is needed to save the state from this threatened calamity.—*New York Medical Record.*

SCIENTIFIC BOOKS

Biology. By Gary N. Calkins, professor of protozoology in Columbia University. New York, Henry Holt & Co. 1914. Pp. i–viii + 241. 101 figures.

This text-book is frankly based upon the well-known earlier work of Sedgwick and Wilson and follows it closely in subject-matter, method and illustrations. It is, however, even more strictly of the informational type and omits all reference to practical exercises or laboratory directions. The physiological side of the subject is emphasized. In the order of treatment the present work departs from the plan of its prototype and substitutes the logical course of proceeding from the simple forms to the complex, for the more practical one of introducing the student to the subject through contact with an organism of such size that it can be studied by the ordinary method of observation. For most teachers this would seem to be a change of doubtful expediency. While the fern and earthworm are still considered at some length, other types (*Ameba* and other Protozoa, *Hydra, Homarus*) receive as much attention. In each case, however, the particular form is studied in connection with some biological principle which it illustrates. The amoeba typifies the activities of one-celled animals; hydra, the nature of animals with tissues; the earthworm, the conditions developing where organ systems are present; the lobster, a more complex condition of organ systems involving the subject of homology. More briefly the nature of one-celled plants is treated in connection with yeast and bacteria; parasitism, as exhibited by *Tænia,* is discussed; and animal associations, adaptations against parasites, and the mechanism of immunity are appropriately presented. A series of these general subjects, including animal descent, evolution, conformity to type, somatic and germ plasm, and Mendelism, appears in the last chapter of the book, wherein the most recent work receives attention.

General biology is defined by the author as the science which deals with "the fundamental principles of living matter" and he then outlines specifically seven subdivisions which embrace practically the entire realms of morphology and physiology. That the recognition of such a subject as general biology is purely a matter of expediency is admitted when the author states that a thorough study of any one of the seven topics would compass the whole field. The purpose of general biology is, however, conceived to be that of forming a foundation upon which the other more specific subjects can be built. It is the thought of the author, and of others who write similar books, that students can be made acquainted with the main biological conceptions through a course designed for this specific purpose instead of acquiring the knowledge as a result of personal experience with many animals and plants. The large results of biological research are presented to the beginner before he is much acquainted with the varied materials manifesting the properties of living matter.

Whether this method is the best for use with an elementary class in the freshman or sophomore year of a college course is open to question. Much depends upon the circumstances in each institution. It may be said, in a general way, that the observational sciences won a place for themselves in the curriculum because they promised a training, through personal experience, that could not be obtained in subjects which are studied merely from books. Information comes thus as a result of discovery, and with knowledge comes training. Not only are facts gained but the method of their acquisition appears through repeated experience with concrete examples. The student is not told that the lobster has twenty somites in its body, but he is asked to discover for himself the number present in a certain specimen. He is not offered the generalization that all normal lobsters have the same number, but he is led to form this conclusion himself through opportunities for comparison with other representatives of the species and by means of the collective experiences of his fellow students. He is not told that there is a large group of branchiate arthropods characterized by this fundamental organization, but he is guided to the formation of such a conception by the observation that a considerable number of such animals, although differing in many other ways, presents a repetition of the same numerical condition. Experience, not authority, is the guide; the goal is a development of the power of accurate observation and the formation of judgments based upon such observations, not the acquisition of cer-

tain facts relating to a group of objects, known as plants and animals, as distinguished from other facts relating to non-living objects, or from still other facts concerning human activities in methods of expression or of living. The path of each student in his approach to this goal is his own, and it varies in infinite degrees from all others—no beaten track of conformity to text assures his arrival.

"But hold!" says the efficiency expert of the curriculum makers, "Will the student learn all about plants and animals in *the* course in biology, will he be able to identify and name those forms he comes in contact with, will he know about the nature of his own body and of his relation to other animals? We want the student thoroughly grounded in the principles of biology, so make a book and teach him these things. For this purpose you may have him for one twenty-fifth of his college course." And so there is much writing of books and the puzzled teacher tries first one and then the other. Something is the matter with each one, so finally he makes a book of his own. If he has decided that the efficiency expert of the curriculum makers *is* right and that a certain group of facts, presented to the students for their acceptance or rejection is the proper content of a course he emerges from his trials very comfortably and, educationally, lives happily ever after.

Of the numerous efforts to supply the demand for text-books which shall inform students regarding the principles of biology, that of Calkins is one of the most satisfactory. Doubtless, in his own laboratory, the book occupies a proper place in relation to the individual work of the student; but it probably would not be far from the truth to assume that, even under these favorable conditions, the element of individual effort is small. In the hands of the dependent teacher even this remnant would disappear. When a descriptive text is used it results, under the best conditions of laboratory work, in confirmation by the student of facts studied in the book; in the absence of proper laboratory opportunities the course based upon it becomes merely another informational subject and the test of its accomplishment purely one of memory. The distinction between the observational sciences and languages, history and other subjects presented on the basis of authority, largely disappears in the former alternative and entirely so in the latter. Undoubtedly the subject-matter of biology would well warrant its inclusion in a college course, but in the face of the opportunities for training students in making accurate observations, forming independent judgments and developing logical habits of thought—qualities that are always so much needed—how poor is the return! It is not to be denied that it is easier to inform students than it is to train them; it is not to be denied that there is a large popular demand that schools should instruct their students upon matters which will be of immediate "practical" use to them later. But it is the duty of schools to recognize that real education is training, and so to devise and administer their curricula as to provide this training, to the best advantage, for the various types of mind that are to be educated. In furthering this purpose the subject of biology offers unique and valuable opportunities to develop the powers of observation, comparison and judgment through personal experience with the scientific method. In view of the great significance of this method in our past achievements, and of its promise for the future betterment of society, it is encumbent upon teachers of those subjects, in which it is best emphasized, to insist that they be given time and opportunity to teach in ways calculated to render effective, to the largest degree, its operation in the activities of their students.

C. E. McClung

An Introduction to the Study of Fossils (Plants and Animals). By Hervey Woodburn Shimer. New York, The Macmillan Co. 1914.

In most sciences it is a remarkable year which does not produce at least one text-book, but paleontology has been taught in this country for eighty years before the appearance of this, the first strictly American elementary text-book of paleontology. Amos Eaton seems to have been the first American teacher to